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ABSTRACT

In 1974 a program was undertaken at the university to improve instruction by means of providing small grants to faculty members to carry out promising proposals for instructional improvement. Eleven projects were conducted in the second year of the program and are described in reports. The projects were for : (1) computer-based instruction in a geostatistics lab course; (2) the use of videosimulation and other media to improve interpersonal skills; (3) videotaping for teaching interviewing skills; (4) a film-centered beginning German course; (5) audiovisual innovation for teaching counseling skills; (6) audiotutorial methods in college algebra; (7) self-study problem modules in physics for engineering and science majors; (8) integration of print and nonprint materials with course objectives; (9) facilitating access to geological materials; (10) an interdisciplinary course in Renaissance art, literature, and music; and (11) sequential interdisciplinary competency-based science and social studies modules. (MSE)

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"Facilitating Student Learning"

Facilitating Student Learning

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Edited By

G. Douglas Mayo

Memphis State University

Memphis, Tennessee

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PREFACE

In recent years a number of institutions have encourages their faculties to improve imstruction by means of providing small grants to faculty members to carry out promising proposals for instructional improvement. A program of this type was initiated at Memphis State University early in 1974. The eleven reports contained herein describe the projects that were conducted during the second year of the program. A similar document containing reports on projects conducted during the first year was published in 1976.

The procedure for selecting projects consisted of inviting full-time faculty members to submit proposals which they felt would lead to facilitation of learning in their courses, and perhaps would have broader applications. It was anticipated that resources available to support such projects would not be sufficient to support all of the proposals that would be submitted. It was also felt that it would be helpful to the faculty members to know in advance the basis on which projects would be selected. Therefore, the invitation to submit proposals contained a list of seven criteria which formed the basis for selection of the projects that were included in the program, and are reported herein. The criteria were as follows:

a. First and foremost, the proposed project should have a good probability of improving learning in the course in which it was undertaken. Stated differently, the basic concept or idea should be sound and capable of effective implementation.

b. If successful, the prospect for continued use of the improvement in the course in which the project was conducted should be good.

c. Projects having a probable "multiplier effect" would tend to receive preference. One aspect of this is the number of students whose learning would be affected. Thus, undergraduate courses having several sections would be good prospects. Another aspect of a "miltiplier effect" would be the extent to which improved learning demonstrated in the course in which the project was conducted could be generalized to a broader spectrum of university courses.

d. The effects of the project should be capable of adequate measurement. Upon completion of the project it is desirable to know

to what extent the objectives of the project were achieved, together with any favorable and unfavorable side-effects.

e. The project should be more appropriate to the purpose of this small grant program than to other university sponsored programs. For example, projects which test hypotheses concerning the basic nature or conditions of learning were viewed as more appropriately supported by grants for faculty research than by this program. In the case of the present program the necessary basic knowledge already should be available and the probability should be good that it could be applied to bring about improvement in learning.

f. Instances in which any required faculty released time could be provided by the academic departments concerned, leaving support of other requirements of the project to the small grant program, would receive some preference over project that required a major part of the grant for faculty salaries.

g. Insofar as practicable, different types of projects, and projects from a number of different departments, would be selected.

Each of the proposals contained a proposed budget which listed the type of support that would be required, and the amount of each item. The budget for most of the proposals ranged from $400 to $1100. Budget items that were included in one or more project proposals included expenses for: supplies, equipment, released time for the faculty member, salaries for student assistants, and funds for such services as clerical, photographic, and printing. As it turned out, the eleven projects fell naturally into four areas: computer based instruction, video technology, audio-visual innovations, and organization and management of instruction. These topical areas will be recognized as the four parts into which the monograph is divided.

The program of small grants to facilitate learning is administered by the Center for Instructional Service and Research. In addition to providing monetary support for approved budget items of the projects, the Center also assists the faculty members conducting each project, to the extent that they desire, in several areas in which the Center purports to have special competence. These areas include systematic course development, development of instructional aids, applications of educational technology, and design of evaluation plans.

As editor, I wish to acknowledge the very obvious contribution of each of the contributors to the monograph, whose names are listed in the table of contents. Thanks also are due to members of the Center for Instructional Service and Research for their constructive participation in a number of the projects, and in particular to Mrs. Barbara Dorsett, who handled the logistic aspects of each of the projects and assumed significant responsibilities in the preparation of the manuscript. Finally, the program of small grants to facilitate learning has received strong support from top

administrative officials of the University, including, especially, the office of the Vice President of Academic Affairs and the Dean of each of the Colleges. This support and the support of Dr. Lester Pourciau, Director of Libraries, in proposing that the composite report of the projects be included in the John Willard Brister Library Monograph Series, were especially instrumental in bring the monograph to fruition.

G. Douglas Mayo, Director

Center for Instructional Service
and Research

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PART I

COMPUTER BASED INSTRUCTION

GEOSTATISTICS - THE USE OF THE COMPUTER TELETYPE IN A SCIENCE LAB COURSE

David N. Lumsden, Department of Geology

As originally conceived Geostatistics (Geology 4301-6301) was intended to introduce geology majors to topics that are available as fragments in other courses in other departments. The press of an already large number of requirements prohibits the department from adding further to the student load. Furthermore, the orientation and problems in other courses may not serve the geology major: hence, Geostatistics. The course was first taught in the sping of 1974. The lab problems were solved with the use of the computer batch system utilizing "canned" programs. The student evaluation of the course was low. They did not feel they had mastered the material and felt that the lab portion of the course left them without a "feel" for the techniques and without any real knowledge of how to interpret the results.

OBJECTIVES

The objective of this project was to restructure the lab portion of Geostatistics to improve the student's understanding of the techniques used and to facilitate the student's ability to treat data and interpret the results. At the same time I revamped the lecture portion, streamlining the material and selecting topics for emphasis at the expense of a complete coverage.

PROCEDURE

The major amount of work was involved in selecting, obtaining, and modifying existing computer programs for use of the teletype. Most of the programs used were specifically oriented toward geologic data manipulation and analysis. There are many such programs, not always in the geologic literature. The sources are listed at the end of this summary (Appendix I).

The programs used to solve the problems had to be short, easy to understand, and fast in terms of CPU time. These criteria permit the student to fully grasp the program method and to run several successive sets of data were called for.

Each program was punched into a card deck, loaded on the disk and run with trial data. Errors were corrected and modifications were made in input and

output modes to allow use of the teletype rather than batch. This means suppression of output that is not essential and restriction of output size so that it fits on the teletype page.

The modified programs, data and subroutines were then loaded into the disk memory of the computer ready to be accessed and run.

CLASS PROCEDURE

The course is scheduled as two lectures and one two-hour lab session per week.

In the lecture portion of the course I introduced the various topics (see Appendix II) and discussed the theoretical and practical backgrounds of the various methods. The small class size made an informal format possible and there was considerable exchange both between the students and myself and among the students.

During the scheduled lab time I handed out a problem (a mimeographed lab sheet) and introduced the week's work, pointing out the specific plan and goals. This usually took 30-40 minutes. I then spend 10-30 minutes covering the salient point in the problem being returned. Since there was only one teletype available, the students were then permitted to work the assigned problem at their convenience. The teletype is housed next door to my office and the students could come in at any time with their questions. This is quite inefficient in terms of time, as it means endless interruptions; however, since there is only one teletype, there was no alternative.

The programs used in various problems are given in Appendix III. This is their approximate order of usage (see lab schedule in Appendix II). The first six weeks consists of problems using statistical tests widely useful in analysis of geologic data. The students performed the various tests then discussed their conclusions. The middle of the course (about six weeks) consists of using more specific techniques, particularly those applicable to data collected along a line (for example down an oil well bore) and over an area (for example, computer map contouring). The last three weeks involved work on sophisticated routines used for analysis of large data blocks and in classification systems.

RUNNING THE PROGRAMS

Next to the teletype we keep the "Blue Book." This is a cookbook on how to use the programs available. It is divided into three parts.

Section one is a brief summary of techniques essential to the use of the canned program, subroutines, and data as well as the creation of new files. Most importantly, there are directions on how to build and edit files.

The second and most important part of this book is an annotated list of

all the available programs. Each program is referenced, modifications are named, required subroutines are listed, and its uses are given. The makeup of the card deck is given in general terms and finally a sample problem, taken from the teletype, is given. This was the most useful part of the book as students constantly referred to the sample problem for guidance. As example is given in Appendix IV.

The third part of the book is a listing of data used in the lab problems.

After an initial period (2-3 weeks) of some confusion, the students settled into the routine and found in the book almost all the answers to their questions.

EVALUATION

Response to this semester's course was much more favorable than in the first attempt. Eight students started the course and five completed it. All five felt the course was interesting and potentially useful. Their specific recommendations were largely in terms of details (changes in data, more detail in certain aspects, etc.); however, their general recommendation of requiring computer programming prior to this course, is not within my control.

GEOSTATISTICS

LAB SCHEDULE

Jan. 22	Introductory Exercise. Introduction to the desk top computer, the teletype and the batch processing system.
29	Simple Data Statistics. Analysis of a suite of pebbles.
Feb. 5	Hypothesis Testing. The four common tests used to compare data sets.
12	A Computer Program. Write short FORTRAN program to perform some elementary computations.
19	Equal Spacing Procedures and Run Tests.
26	Regression Analysis.
Mar 4	Time Trend Analysis.
18	Auto and Cross Association.
25	Transition Matrices.
Apr. 1	Map Contouring and Trend Surfaces.
8	Multiple Regression Analysis
15	Cluster Analysis
22	Factor Analysis

APPENDIX I

SOURCES OF PROGRAMS

Davis, J.C., 1973, Statistics and Data Analysis in Geology, John Wiley and Sons, 550p.

Klovan, E.C., 1975, Personal communication.

Lumsden, D. N., 1975, Home written.

Till, R., and Hopkins, D.T., 1972, A collection of Computer Programs in Basic for Geology and Geophysics, Geology Department, University of Reading, Reading, England.

Sokal, R. R., and Rehlf, F. J. 1969, Biometry, W. H. Freeman and Co., 776p.

APPENDIX II

GEOSTATISTICS
OUTLINE
D. N. Lumsden

I. INTRODUCTION
- A. Scope and aims of this course
- B. The Concept of Research
  - Hypothesis, Observation, Experiment, Theory, Law
- C. Numbers and the Need for Quantification
  - Nominal, Ordinal, Interval, & Ratio Numbers
- D. Population and Sample

II. COMPUTERS AND PROGRAMMING
- A. The Desk Top Computer
- B. The Batch Processing Mode
- C. The Teletype
- D. FORTRAN
- E. BASIC
- F. Canned Programs
  - IRIS, SLAP, BMD, GEOSTAT

III. MATH MODELS AND FREQUENCY DISTRIBUTION
- A. Models
- B. Distributions
  1. Normal
  2. Lognormal
  3. Binomial
  4. Poisson
  5. Circular and Spherical Normal

IV. STATISTICS
- A. Introduction
- B. Graphical Presentation
- C. Measures of Central Value-Mean, Mode, Median
- D. Measures of Scatter-Standard Deviation and Variance
- E. Measure of Assymetry-Skewness
- F. Measure of Peakedness-Kurtosis
- G. Coding and Transformation
  1. Coding
  2. Log Transormation
  3. Z-Transformation
  4. Binary Coding

V. HYPOTHESIS TESTING
- A. Types of Errors
- B. T Test
- C. F Test
- D. Analyses of Variance
  1. General
  2. One Way
  3. Two Way
- E. Chi-square test

VI MATRIX ALGEBRA, A QUICK LOOK
- A. General
- B. Addition and Subtraction
- C. Multiplication
- D. Division by Inversion
- E. Solution of Simultaneous Linear Equations
- F. Eigenvalues & Eigenvectors

VII ANALYSIS OF DATA SEQUENCES
- A. General
- B. Equal Spacing Methods
- C. Run Tests
- D. Regression Analysis
- E. Correlation Analysis
- F. Auto and Cross Association
- G. Markov Chain Analysis

VIII MAP ANALYSIS
- A. General
- B. Point Distribution
- C. Contouring by Computer
- D. Trend Surfaces
- E. Map Comparison

XI. MULTIVARIATE DATA ANALYSIS
- A. Multiple Regression
- B. Discriminant Functions
- C. Cluster Analysis
- D. Factor Analysis

SAMPLE PROBLEM

Uses data D521 from DAvis (p.255)

```
!FØRT XASSØC ØVER TEMP
 EXT. FØRTRAN IV, VERSIØN DOO
ØPTIØNS >NS,BØ

!SET F:105/D521

!LINK TEMP,READM,TELPRN,TSPLØT ØVER TEM
     LINKING TEMP
     LINKING READM
     LINKING TELPRN
     LINKING TSPLØT
'P1' ASSOCIATED.

!TEM.
CØDED DATA MINE SECTIØN
1
                1.4167    2.2500    3.0833    3.9167    4.7500    5.5833
          1.0000    1.8333    2.6667    3.5000    4.3333    5.1667    6.00
                                    0
          +----+----+----+----+----+----+----+----+----+----+----+----+
    2.0001          1 *       1         1         1         1         1
    4.0001          1         1         1     *   1         1         1
    5.0001          1         1         1         1     * 1         1
```

APPENDIX III

PROGRAMS ON FILE

Univariate Data Manipulation:

COVAR-	simple data statistics, mean, standard deviation variance and covariance between 2 samples
ONEVA-	one way analysis of variance
TWOVA-	two way analysis of variance
ZTRANS-	performs the Z transformation on data
ANALVAR-	simple analysis of variance program in BASIC

Bivariate data analysis:

CORAN-	correlation analysis
LINFIT-	regression analysis
POLYD-	polynomial curve fitting to bivariate data

Analysis of data sequences:

EQSPR-	equally spaces data originally collected at unequal spacing
RUNTEST-	a BASIC program to estimate randomness of data collected in sequence
MARKOV-	Markov Chain Analysis
SMOOTH-	moving average smoothing of data
MVAGE-	a BASIC program for a moving average smoothing of data
AUTOCOR-	auto-correlation analysis
XASSOC-	cross-association of two data sequences
FOURER-	Fourer analysis of data strings

Mapping programs:

CONMAP-	plots a contour map of original map data
TREND-	plots a contour map of trend surfaces of various degrees

Multivariate analysis:

RMULT- multiple regression

CLUSTER- cluster analysis with dendogram

FACTOR- R & Q mode factor analysis

APPENDIX IV

SAMPLE OF "COOKBOOK" PROBLEM

XASSOC (FORTRAN)

From table 5.10, p. 252, in Davis. Reads in and plots two sets of nominal data, then searches for a fit between them and plots a correlogram of goodness of fit at each successive fit location.

Uses subroutines READM, PRINTM, AND TSPLOT.

DATA DECK

Card 1 Title

Card 2 N,M, where N is number of data cards and M is the number of variables on each card, Here M=1. Use 2I3 format.

Card 3 Format for reading data

Card 4-? First data deck

Card ?1 Title of second data set

Card ?2 N,M, for second data set

Card ?3 Format of second data

Card ?4-? Second data set.

PART II

VIDEO TECHNOLOGY

APPLICATION OF VIDEO SIMULATION AND OTHER MEDIA TO IMPROVE INTERPERSONAL RELATIONS SKILLS

Britt G. Finley, Sarah I. Mynatt, and Katherine K. Kim
Department of Nursing

Interpersonal relation is defined by King (1971) as "the interaction of two or more individuals in existential moments in time for some purpose or goal." Skill in interpersonal relations is recognized by the nursing profession as being critical to competent performance. It is the essential ingredient in helping patients meet their needs by assisting them to identify and verbalize thoughts and feelings. Peplau (1952) feels that "experiences that have to do with how the person feels about himself and how he feels about what is happening to him....require counseling roles on the part of nurses." The skill is utilized in each nursing process regardless of clinical setting.

Traditionally nurse educators have spent large amounts of time and energy in the aspect of mastering vocabulary, principles and concepts of interpersonal relations. The nursing student can be taught the principles of the communication process, but this does not automatically transfer into nursing behavior. In order to insure that nursing students develop their competence in interpersonal relations, it is imperative that they gain experience and skill through a systematic, planned learning experience.

For the past ten years, the nursing literature reports an increasing number of studies in which television is utilized by nursing educators. Most of the studies, however, are concerned with teaching technical nursing skills. Few studies have been reported which deal directly with the use of video simulation as a teaching strategy of interpersonal relation skill. Barlow (1973) reported use of televised role-plays for inservice education. The program gave nurses a new understanding of patient needs and of their own strengths and weakness in meeting them. Okamoto (1962) reported a study which tested the effectiveness of television in teaching students about the establishment of meaningful relationships with patients. Eggert (1975) discussed in detail the use of videotaping for Registered nurses to challenge courses in a baccalureate program by validating their skill in an interpersonal situation. This use of videotape was not to improve skill, but rather to measure it.

Literature related to the field of counseling and guidance has numerous

examples of video simulation in teaching interpersonal skills. Gustafson (1971) described the multiple benefits he found in video simulation as a teaching tool. Eisenberg and Delany (1970) related the use of video simulation in teaching to an increased acquisition of student skill in interpersonal relations. Spivack (1973) explained that students using simulated videotaped critical incidents were able to identify and understand client behavior, their own behavior, and the dynamic nature of the counseling relationship. Eisenberg (1971) detailed numerous uses of video simulation in teaching counseling skills. Yenawine and Arbuckle (1971) contrasted audiotape and videotape in teaching counseling skill and concluded that videotape provided a meaningful means for critical analysis of interaction. In summary, the use of video simulation has these characteristics:

1. Provides for observation of both verbal and non-verbal behavior

2. Provides accurate data for discussion by allowing both the student and the teacher to hear and see the same situation

3. Provides an immediate and/or delayed playback for recall of understanding the dynamics involved in a situation as well as evaluation by a third person or others to validate data

4. Provides for the student an observation of himself, both subjectively and objectively and allows him to recognize both his strength and weakness more clearly than do teacher comments

5. Provides a learning environment which is less threatening than the real world, provided their is an adequate orientation program given the student for the use of videotape as a learning media.

In addition to the use of videotaping, other media, such as, books, audiotape programs and 8mm film programs were used to enrich student's learning experiences.

PURPOSE

It was the purpose of the project to increase student's interpersonal skill. One of the major course objectives of Nursing 2114 is to teach the use of facilitative behaviors, which are described by Benjamin (1969) as those behaviors which enable the participant to recognize, to feel, to decide and to choose whether to change.

The enabling objectives of the project were for the student to demonstrate:

1. Increased recognition of factors influencing own perception
2. Increased verbalization of her thoughts and feelings
3. Increased recognition of verbal and non-verbal cues in others and self that either facilitate or block interaction
4. Increased use of facilitating behaviors in interpersonal relations.

METHOD

The present section describes procedures employed in implementing a multi-media approach in teaching interpersonal skills. The use of texts, teacher designed learning guides, films, audio and videotapes and group interactions were used to maximize the learning and practice of interpersonal skill.

Participants

The students involved in Nursing 2114, Fundamentals of Nursing Care V (Psychiatric Nursing) at the Memphis State University Associate Degree Nursing Program for the second half of Fall, 1975, and the second half of the Spring, 1976, semester participated in this project. Nursing 2114 is a five semester credit hour course taught in six weeks period. Because the multi-media approach developed as the project progressed, the total process was not evolved until Spring, 1976.

Twenty-eight students participated in the preparatory phase of this project during the Fall semester 1975. For the operational phase, Spring semester 1976, eighteen students were involved.

Pre- and Post-tests

A stimulus film, super 8mm sound film developed by Narrow (1970) was used for the pre- and post-test. The stimulus film consists of thirty brief patient situations to which the students were asked to write a verbal response. The first fifteen patient situations were used as a pre-test. The latter fifteen were used as the post-test.

At the end of each patient situation the film was stopped for one minute, and the student was asked to write how he would respond if he were the nurse in the situation.

The written student responses were scored independently by two course instructors according to the modified Carkhuff's Scale for Gross Ratings of Facilitative Interpersonal Functioning as printed in Instructor's Guide for Interpersonal Relationships in Nursing Unit 1: Making a Sensitive Response by Narrow. (1970) (Refer to Appendix A)

For rating responses the raters used the following guidelines listed by Narrow (1970).

1. It was assumed the response used a neutral tone of voice.
2. Each response was rated at its highest level unless some part of it was clearly hurtful, rejecting or critical. It was then rated 1.
3. If a feeling was specified, it was rated as if the perception of the feeling was accurate.
4. The raters did not try to differentiate between physical and psychological comfort as it relates to feeling.

If there was any disagreement on the rating the response was reexamined by both the members of the evaluation team and a decision reached. Since this was the first operational phase the reliability of the raters was not statistically checked. However, we found that agreement could easily be reached when the rationale was shared.

The level of sensitivity of the verbal response were designated on a five point continuum scale which is a modification of Carkhuff Scale. Narrow (1970, pp. 7-8)

Level 1: This level includes all responses in which the nurse criticizes, argues, scolds, gives advice, exerts authority, or rejects the ideas, actions, or feelings of the patient.

Level 2: This level includes all neutral responses such as social amenities, simple directions, factual information, explanations, and other similar responses.

Level 3: At this level, the nurse indicates her understanding and acceptance of the patient's ideas, and she approaches the patient's feelings indirectly.

Level 4: The student realizes and verbalizes that the patient is feeling something although no specific feeling or emotion is identified.

Level 5: The student tries to state her own perception of the patient's feelings and mentions a specific feeling or emotion. Acceptance of the feelings is stated or implied.

Procedure

The project was implemented in two separate phases, each of which will be summarized in the following sections.

a. Preparatory Phase

This phase consisted of investigating a more effective teaching strategy of interpersonal relation skills, implementing the strategy with a sample, and evaluating the outcome of this phase of the project.

The student in the Fall of 1975 participating in this phase as the instructors familiarized themselves with videotaping techniques and sought other media which were utilized and purchased in the project. An audiotape program, "Empathy Training Workshop" and a 8mm film program, "Making a Sensitive Response" were purchased.

The students were videotaped once in a group as several of the group members role-played a patient-nurse situation. Immediately after each role play the videotape was replayed for discussion and feedback of the interaction.

It was stressed to the groups prior to role playing that the role play

and responses were a non-graded learning experience which was to increase their awareness of their own interaction and interpersonal skills. The instructor's role was to be a facilitator of the discussion and to provide an opportunity to practice interpersonal skills in a supportive environment. The students' strengths were reinforced and areas of improvement or need for improvement were identified.

The students used the rating scale which was published Interpersonal Relationships in Nursing Unit 1: Making a Sensitive Response, (See Appendix A) to rate the level of sensitivity of the responses in the role play situation.

After each session each group was asked to make recommendations for improvement of the learning experience. The first group recommended that we choose students by lot to play an assigned role instead of asking for volunteers. This recommendation was implemented with success in the operational phase. Each group suggested that the experience remain a learning experience which was not graded, and each group stated it was a worthwhile learning experience which could not be duplicated by other methods.

A tool was developed for each student to use for self evaluation of a helping interview which was to be videotaped in the operational phase of the project. The tool was a modification of Eggert's challenge exam in interpersonal skills (1975).

b. Operational phase

The operational phase was begun with a great deal of enthusiasm for the student's increased ability to learn and practice interpersonal skills by videotaping. In this phase each student participated in the total teaching strategy developed in the preparation phase. The instructors were familiar with the teaching tools and eager to utilize them. The total emphasis was on non-graded exercises aimed at increasing interpersonal skills.

The following teaching strategy was employed during the operational phase of this project:

1. During the first week of the course, the student took a pre-test. The student watched 15 critical incidents on 8mm sound film where patient situations are presented as stimuli. Immediately following each incident, the student was asked to write how he would respond if he were the nurse in the situation. Time involved: 30 minutes.

2. The student read The Helping Interview by Benjamin using a self-instructional study guide. Following this, the student was tested for mastery of concepts using nurse-patient situations. This test was not counted toward the course grade and there was teacher-student discussion of misunderstandings following the test. Time involved: 1½ hours discussion for entire class in addition to individual reading time.

3. Orientation to videotaping was given to the student for the purpose

of reducing the effect of other variables on the project when the subjects are introduced to a new experience. Use of equipment was explained and students were given the opportunity to handle the equipment and see themselves on the screen. This was followed by videotaping of student role-play situations with discussion of the interpersonal skill concepts. Although all students were videotaped in the group as they observed others role-play, due to time limits, every student could not be involved in the role-play situation. All students in the group observed role-play and were videotaped as they observed. This tape of the role play and the observers was replayed immediately for the group and discussed with the instructor. Time involved: 2½ hours. This exercise was a learning non-graded experience aimed at building interpersonal skills.

4. The student viewed and discussed Narrow's 8mm sound film series, "Making a Sensitive Response." This is a series of five separate films which demonstrate patient-nurse situations, each with an effective sensitive and then a non-effective non-sensitive nurse role-model in human relations. The series highlights separated these aspects: nurse awareness of patient cues, means to initiate effective interaction, means of acknowledging patient's feelings, difference between reassurance and sensitivity. Time involved: 4 hours.

5. The students participated in the Listening Group's audiotape and workbook Empathy Training Workshop by reading, listening, and discovering through group interaction. The workshop consisted of eight sessions which covered key concepts to helpful communication and the art of empathy. The structure of the workshop emphasizes the individual first becoming aware of his own reactions and how he communicates. The instructor and group create a nonjudgemental climate that allows for self expression. Time involved: 12 to 16 hours.

6. Optional learning experiences with filmstrips, audiocassettes, and books were available in the Nursing Laboratory. These were selected by the student according to the individuals learning need; therefore, the time involved was varied.

7. The student interviewed a hospitalized patient ten times for, at least, twenty minutes each time and wrote the interaction by listing the dialogue, dynamics, and evaluation. This was reviewed by the instructor, and comments about the interaction were given. The time involved was varied and was incorporated as part of the clinical time.

8. The students received acceptance as an individual by the instructors who serve as role models by using facilitative responses during interaction with the students. Acceptance of the student is defined as interacting with the student in such a manner that respects the student's abilities, his potential and his being as worthwhile. It involves a teacher relationship with the student that is open and honest and one which recognizes each student's capacity to change. The personal philosophy of the instructors is that interpersonal skill is learned best by experiencing it as a participant.

It is our belief that we can teach only as high a quality of empathy as we ourselves demonstrate in our own personal interaction. The total teaching emphasis was not on a grade for the present but on improvement of knowledge and skill by the end of the course. The final course examination is fifty percent of the total grade, so that the student is not penalized unduly for difficulty early in the course.

9. Toward the end of the course, each student videotaped a 5 - 10 minute segment of her interaction as a "helper" with a "helpee." Most of the students chose their classmates as their "helpee" although a few of them used other friends as their clients. Using a tool, "Videotaping Nurse-Client Interaction," the student self-evaluated her own interaction while she replayed the videotape. Later both the student and instructor replayed the videotape for further feedback and discussion. Time involved: 2 hours.

10. Post-test, a parallel form of the pre-test, includes watching another 15 critical incidents on 8mm sound film where patient situations are presented. The student was asked to write how he would respond if he were the nurse in the situation. Time involved: 30 minutes.

RESULTS

Pre/Post-Test Results

Learning was measured by the decrease in Level 1 responses, which are insensitive, and an increase in the number of Level 3, 4, and 5 responses, which are sensitive responses. This measurement follows the same means of measurement used by Narrow. Level 3, 4, and 5 were grouped together because the increase was often too small for reliable assessment. The difference between the pre-test results indicate the learning that occurred. (Narrow, 1970, p. 11) The learning was expressed in terms of the number of increases or decreases per student.

a. McGraw Hill Group

In the testing by the author of the film series using three schools of nursing and 122 students the average learning per student was:

4.0 fewer nonsensitive responses (Level 1)
4.7 more sensitive responses (Level 3-5)

b. Memphis State University Group

In the testing done with the Memphis State University Associate Degree Nursing student the average learning per student was:

3.4 fewer nonsensitive responses (Level 1)
8.1 more sensitive responses (Level 3-5)

This group was the preparatory group and had one student who has her Master's Degree in Guidance and Counseling. When the score of the master's prepared person was removed, the results were:

4.3 fewer nonsensitive responses (Level 1)
5.2 more sensitive responses (Level 3-5)

During the operational phase of the project in the Spring of 1976, the average learning was:

2.5 fewer nonsensitive responses (Level 1)
7.3 more sensitive responses (Level 3-5)

In the operational group there was 0.37 nonsensitive responses per student in the post-test, which almost eliminated the use of nonsensitive responses by the students. The above figures are summarized in Table 1.

Table 1 Comparison of the Average Learning

	McGraw Hill N=122	MSU Fall '75 N=28*	MSU Fall '75 N=27**	MSU Spring '76 N=18
Level 1	- 4.0	-3.4	- 4.3	- 2.5
Level 2	Not available	-4.5	- 8.1	- 4.9
Level 3	+ 4.7	+8.1	+ 5.2	+ 7.3

\- Indicates decrease in number of responses
\+ Indicates increase in number of responses

* Includes a master's degree student
** Excludes a master's degree student

It should be noted that the investigators made no effort to compare the characteristics of the students used by McGraw Hill and the Memphis State University, it is known only that both groups were nursing students.

Interpretation of Pre- and Post-test Scores

The results demonstrated an increase in learning even during the preparatory phase of the project greater than the results reported by McGraw Hill with the filmstrip series program alone. This seems to support the use of video and other learning methods to increase the learning of interpersonal skills.

As shown in Table 2, during the operational phase the students pre-test level averaged 2.9 nonsensitive responses and the post-test indicated a 0.4 nonsensitive responses per student which almost eliminates the use of a nonsensitive response. Since the nonsensitive response was used so rarely, one could conclude that the students were already caring individuals in the nursing program.

Table 2 Comparison of the Average Number of Responses Per Student on Pre-test and Post-test

	Level 1		Level 2		Level 3 - 5	
	Pre	Post	Pre	Post	Pre	Post
Fall'75 (N=28)	4.1	0.72	8.0	3.5	5.4	13.5
Spring '76 (N=18)	2.9	0.4	8.4	3.7	3.5	10.8

The data also indicated that in the operational group during the pre-test the most frequent response was the neutral response (8.4 per student). The student in the nursing program has had a strong emphasis on the problem solving approach which deals with content rather than feelings until the student enters the Psychiatric course; therefore, the results could have been anticipated in the nursing curriculum.

The post-test results indicated that the most frequent response during the operational phase was the sensitive response. (10.8 per student.) One needs to remember that the post-test was given after all the learning experiences and videotaping were completed. These exercises were felt by the faculty to be valuable learning experiences in teaching interpersonal skills.

Student's Responses to Project

During the initial videotaping experience some students were reluctant to videotape and role play. The following external factors are believed to influence this reluctance: 1) The student's expectation of self, 2) The student's expectations of faculty based on past experience with other faculty, and 3) Lack of student trust with new faculty and content.

The students were all very pleased with the amount of learning gained from the videotaped interaction and urged that coming groups have more videotaping experiences. The students developed a high level of mechanical skill in videotaping. The orientation to operating the equipment was so successful that most of the interviews were taped by students independently.

Teacher's Response to the Project

We are pleased with the outcome of the project in terms of student achievement

on post-test and analysis of student interaction on videotaping. We learned a great deal about the use of videotape as one of the teaching media. We were able to utilize the five unique characteristics of videotaping, already mentioned, as a teaching strategy for interpersonal relation skills. For observation of self, both verbal and non-verbal behavior, we feel that there is no substitute for videotaping.

Interest has been demonstrated by other faculty members in utilizing videotaping in other nursing courses. Instructors involved in the project learned much more about self in working with students.

RECOMMENDATIONS AND CONCLUSIONS

Recommendations

On the basis of our experience, we would like to make the following recommendations.

1. Increase the number of videotaping of interaction experience to two or three for each student. This number may vary depending on student's need.

2. In this project we utilized video simulation during the student's learning process. However, we see the potential of using videotaping for evaluation of interpersonal skill. We revised the tool which can be used for this purpose in the future. In this project this tool was used for teaching purposes only.

3. It is imperative that video equipment be in good working condition at all times. We found that the student easily learns to operate the equipment, but a technician should be readily available when the need rises. The technician from the Learning Media Center was essential and most helpful for the operational phase.

4. Empathy Scales used for teaching purposes should be consistent. The Empathy Workshop and Making a Sensitive Response used a modified Carkhuff Scale, which has slight variations. The student uses the Empathy Workshop scale in several repeated sessions, and for this reason the instructors recommend its consistent use.

5. The raters should practice and validate scoring responses.

6. The faculty should continue to play a supportive role during the experience. The student must feel free to explore himself and try out new behaviors without fear. The student must first feel acceptance for others. Teaching emphasis on growth and personal strengths should continue.

Conclusions

The purpose of the project was to facilitate the student's acquisition of interpersonal skills. The multi-media approach did lead to increased learning as evidenced by the difference in the pre- and post-test. The investigators strongly believe that the teaching strategy success was dependent upon the open, caring environment created by the instructors. This climate of acceptance was necessary for the student to increase verbalization of thoughts and feelings, to recognize her own verbal and nonverbal behaviors and those factors influencing her perception, and to risk change. The experience also was influenced by the ability of the teachers to serve as a role model.

The use of video simulation as a teaching strategy is enthusiastically viewed by the investigators. The use of seed grant money allowed the purchase of tapes and use of the video equipment from the Learning Media Center. The investigators feel quite strongly that videotaping is a crucial and creative teaching tool. The faculty has recommended to its audiovisual committee that the Department of Nursing purchase its own equipment immediately. The recommendation has been acted upon positively.

If the criteria for holding something of value is that action is taken, then the affirmation of video simulation by the investigators says a great deal. The course will continue its present use of videotaping and enlarge upon it by allowing student free use of the equipment to videotape, at will, simulated interactions. The student will be given the option of teacher assistance in evaluation. The investigators also look towards videotaping as an evaluation tool to measure and maintain course standard for interpersonal skill. At the present time, however, its focus is as a teaching tool.

In summary the use of videotaping and other media to teach interpersonal skill was very successful. Not only did the student's ability to use sensitive responses in patient situation increase, but the students and instructors became more fully aware of themselves as unique individuals. Students and instructors agreed that the video interviews and other media utilized jointly were superior to either means utilized alone.

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Criteria For Rating Responses *

Level 1: Hurtful, Rejecting, Negative, Insensitive

Examples

Criticizes: "You shouldn't ... ," "Don't ...," "You're always ..."
Scolds
Argues
Rejects ideas, actions, or feelings
Indicates that ideas and/or feelings are wrong, inaccurate, invalid, unimportant, faulty, or undesirable
Ignores
Gives advice: "You ought to ... ," "You should ...," "You ought not to ... "
States *own* opinion
Defends ideas or actions of self and/or other staff

Level 2: Neutral

Examples

Deals with the *problem*, not the patient
Focuses attention on patient's *problem* instead of on patient
Gives directions
Makes a suggestion
Gives an explanation
Refers to policy, rules, or reasons in a neutral, noncritical way
Asks a factual question
Refers patient's question back to patient
"Reassures" patient
States what she will do (or try to do) about the problem
Does not acknowledge feelings of patient
Compliments, flatters, makes positive value judgment
Focuses attention on other things or on person other than the patient (patient is *not* the focus of the response)

Levels 3 to 5: Helpful, Accepting, Positive, Sensitive

Level 3 Examples

Accepts *ideas* of patient (may give clearcut permission)
Asks question to better understand what patient *thinks*
Approaches feelings of patient *indirectly:*
  Refers to relationship between situation and patient
  Describes situation
  Uses third person *it* ("It must be ... ," "It is ... ")

Level 4 Examples

Acknowledges that the patient is feeling something
Specific feeling is *not* identified or stated
Asks a question to better understand how patient *feels*
Uses both *you* and *feel* in response ("I know how *you* must *feel*.")

Level 5 Examples

Tries to state own understanding of patient's feelings
Refers to a *specific* feeling or emotion
Accepts patient's *feelings*

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* Barbara Narrow Instructor's Guide for Interpersonal Relatipnships Unit 1: Making a Sensitive Response. (New York: McGraw Hill Co., 1970) p. 10

VIDEOTAPED INSTRUCTIONAL SYSTEM FOR TEACHING INTERVIEWING SKILLS

James A. Boone, Department of Psychology

Teaching methods which have been designed to instruct students in the acquisition of interviewing skills are remiss in providing concise instruction and in providing direct feedback concerning student performance. Traditional teaching methods have relied upon classroom lectures, audiotape interview replay and assimilated role-play in training students to become competent interviewers. These techniques fall short of the desired prescriptions of discrimination learning and feedback which are necessary for teaching students how to be effective interviewers.

Videotape replay procedures have been employed in a variety of class room settings from teaching students study skills (Powell, 1972) to teaching counseling skills (Kelly, 1972). Empirical validation for the videotape procedure as an instructional as well as a therapeutic device has been presented by several investigators (Pearson, 1972; Dinoff, et al., 1970; Serber, 1972; and Boone, 1974). These authors have demonstrated the effectiveness of videotape replay in both teaching and therapy.

PURPOSE

The purpose of the present project was to develop a series of videotapes which demonstrated the proper application of interviewing skills in a therapy context and to incorporate videotaped feedback procedures into current methods of teaching interviewing. The stated goals of the project were:

1. To develop a videotaped instruction program to be used in teaching interviewing
2. To increase student learning via videotaped instruction and videotaped feedback
3. To shorten the amount of class room time spent in lecture and increase the amount of time the student spends practicing his newly acquired skills.

METHOD

Development of Videotaped Instruction

The present author developed four one-hour videotapes which demonstrated the proper use of interviewing skills. The tapes were devoted to a demonstration of the use of minimal encouragers, reflection of feeling, paraphrasing, and summary. Each sequence was accompanied by a commentary relating the appropriate and inappropriate uses of interviewing skills. These videotapes were incorporated into an interviewing course (#4503 Special Problems in Psychology).

Student Participation

A total of six students completed the course. Students ranged across disciplines and were admitted from Psychology, Sociology, Guidance, and Nursing. The course was offered during the Spring term of 1976.

Instructional Procedure

Students were given an orientation lecture during the first class period and were administered a written pretest on interviewing skills. All students were videotaped in a pretest role-play interview session during the second class period. During subsequent sessions, students were presented videotaped instruction on how to effectively conduct an interview. The videotaped instructional sequence was presented in four phases as follows:

Phase 1. Greeting the client, establishing rapport, the use of minimal encouragers and asking open-ended-questions; followed by student participation and feedback

Phase 2. How to paraphrase and reflect feeling; followed by student participation and feedback

Phase 3. How to summarize interview material and termination of the interview; followed by student participation and feedback

Phase 4. A presentation of the interview from start to finish.

Upon completion of the videotaped instruction, all students were required to conduct an entire interview which was videotaped and replayed for the student along with a commentary by the instructor.

Feedback Procedure

Students received videotaped feedback for each phase of instruction. Two class periods per week were devoted to discussion, practice and feedback. All students were videotaped during each phase of the instructional sequence and received videotaped feedback for each phase. The videotaped feedback consisted of the student viewing himself on videotape along with a commentary by the instructor which pointed out the critical aspects of the

interview. Following the feedback session each student was given an outside assignment to practice skill areas which had been noted as weaknesses. These assigements were audiotaped and replayed during individual sessions with each student.

Time Period of the Project

The overall time period for the project was from September 1, 1975, to June 1, 1976. The development of videotaped instructions took place during the Fall term 1975 from September 1 to December, 1975. The demonstration tapes were incorporated into class procedures during the Spring term of 1976.

EVALUATION PROCEDURE

The course evaluation consisted of two pre/post designs. All students were administered a written pre/post test on interviewing skills and, in addition, were administered a pre/post behavioral interviewing test recorded on videotape. Two raters coded and recorded the frequency of interview behaviors shown in the videotape before and following instruction, thus allowing for a pre/post test analysis of student performance (Shaw, 1974). Additionally, a control group consisting of students who were not enrolled in the interviewing class were administered pre/post test written and behavioral assessments identical to the interviewing group. These students did not receive any training in interviewing. A comparison of their pre/post performance provides further illumination for training effects. These data were treated by way of an analysis of variance and dependent t-tests. Both the written pre/post test and the behavioral pre/post test data are reported in the result section of this paper.

RESULTS

The results of the evaluation clearly show the method of videotaped instruction to be effective in teaching interviewing skills. The experimental and control groups were compared by way of an analysis of variance repeated measures and t-tests on both good skill and poor interviewing skill categories. The good interviewing skills category was derived by combining the interviewing behavioral categories of minimal encouragers, open-ended questions, paraphrase and reflection, and summarization. The poor interviewing skill category was derived by combining closed-ended questions, and poor attending behavior. Two raters recorded instances of each behavior using a 15-second interval recording method. The recordings were quite reliable at both pretest and posttest. The average percentage agreement between raters at pretest was .93, and the average percentage agreement at posttest was .95.

The analysis of variance repeated measures on the written test clearly shows the experimental group to be significantly more improved from pretest to posttest than the control group $F\ (1, 8) = 16.514$, $p < .004$.

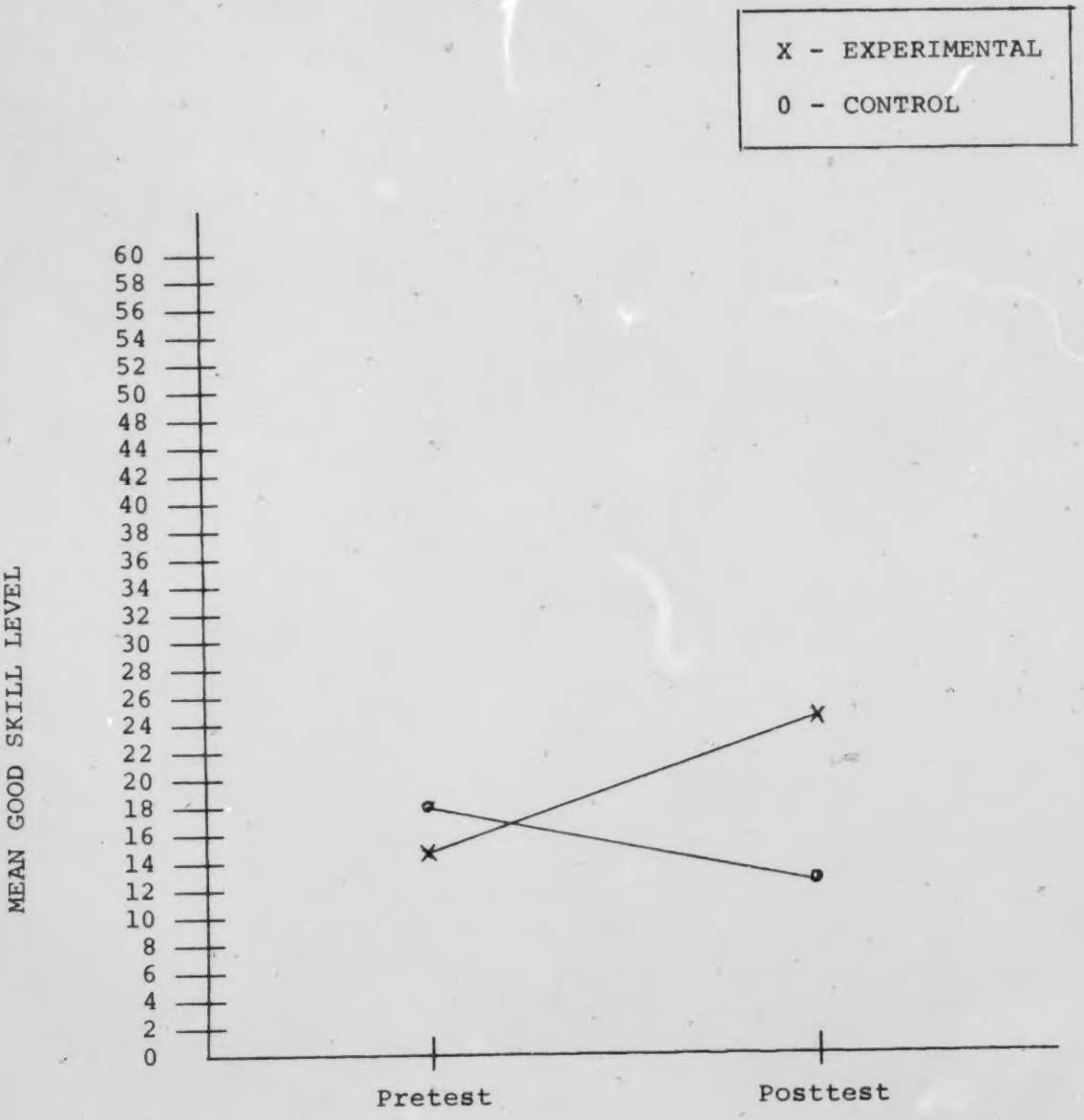

FIGURE 1. MEAN GOOD INTERVIEWING SKILL LEVEL
EXPERIMENTAL AND CONTROL GROUPS
AT PRETEST AND POSTTEST

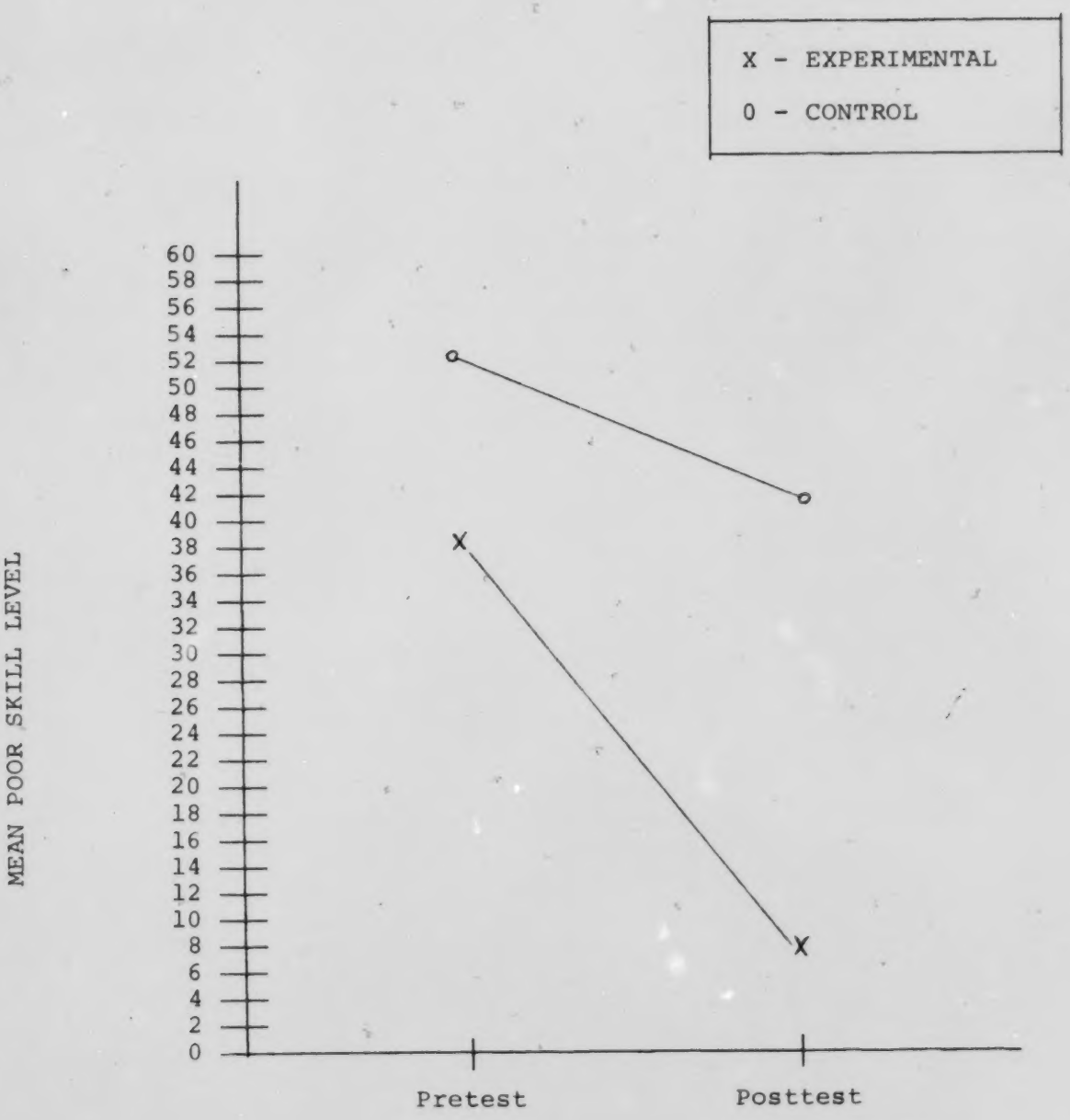

FIGURE 2. MEAN POOR INTERVIEWING SKILL LEVEL FOR THE EXPERIMENTAL AND CONTROL GROUPS AT PRETEST AND POSTTEST

Additionally, the analysis confirmed a significant improvement for the experimental group on good interviewing, $F(1, 11) = 7.671$, $p < .018$, and a significant reduction in poor interviewing skills, $F(1, 11) = 13.540$, $p < .004$. The analysis was further bolstered by the results obtained through t-tests. Firstly, the t-test indicates that there were no significant differences between groups at pretest, $t(11) = .631$, $p > .05$ for good interviewing skills and $t(11) = .397$, $p > .05$ for poor interviewing skills. Thus both groups were equated at pretest on both good and poor interviewing skills.

The t-test analysis at posttest clearly shows the experimental group to be demonstrating more frequent usage of good interviewing skills (mean = 24-33) as compared to the control group (mean = 11-43), $t(11) = 4.38$, $p < .05$ (Figure 1). The experimental group also evidenced a significant reduction in the use of poor interviewing skills in comparison to the control group (mean = 36,86), $t(11) = 4.66$, $p < .05$ (Figure 2).

The within group comparisons on good skills and poor skills provide further support for the effectiveness of the videotaped instructional system in teaching interviewing skills. The experimental group showed a significant change from pretest on good interviewing skills, $t(5) = 5.19$, $p < .05$, (Figure 1) and a significant pre/post test change in poor skills, $t(5) = 2.82$, $p < .05$ (Figure 2). Again, the experimental group showed a significant increase in good interview skills and a significant decrease in poor interviewing skills from pretest to posttest. In contrast, the control group did not improve in good interviewing skills, $t(6) = 1.40$, $p > .05$ (Figure 1) nor was there a significant change in their use of poor interviewing skills, $t(6) = 1.34$, $p > .05$ (Figure 2).

CONCLUSION

In conclusion, the videotaped instructional system for teaching interviewing skills has demonstrated its effectiveness. Both within and between group comparisons provide data to support the contention that videotape modeling and feedback are effective in teaching fairly naive students the art of interviewing at least as it is employed in information gathering situations. The procedure for instruction is straightforward and easily adoptable to most classroom situations. All one need to do is clearly specify in behavioral terms those skills he or she wants to teach and demonstrate them via videotape. The videotape has the distinct advantage of allowing for several repetitions of specific or wholistic behavioral patterns. Additionally, one can further enhance instruction by videotaping segments of student performance and using this for feedback. The system is highly recommended for adoption as an adjunct tool in teaching both undergraduate and graduate level skills courses.

PART III

AUDIO-VISUAL INNOVATIONS

DEVELOPMENT OF A FILM-CENTERED BEGINNING GERMAN COURSE

Richard B. O'Connell, Department of Foreign Languages

The course developed in this project is centered around the 26 segments of the instructional film Guten Tag, which was jointly produced by the Bavarian Broadcasting Service and the Goethe Institute. The goals aimed for in the project were: (1) to improve the first-year student's ability to understand German spoken by a wide variety of native speakers; (2) to give the first-year student greater ability to express himself in spoken German; (3) to bring the first-year student into as direct contact as possible with everyday life in Germany; and (4) to stimulate the first-year student's enthusiasm for learning German. The project further aimed to demonstrate that the above goals could be attained without sacrificing any of the objectives of the present first-year German course.

PROCEDURE

Each segment of the Guten Tag film provided the basis for an instructional unit of three class hours. The film segment, 15 minutes in length and presenting an everyday kind of situation in a lively, often humorous, fashion, was shown to the class twice, followed each time by practice with a tape of the dialogue. Through practice in the class periods and individual study outside of them the students were required to master the material of the dialogue to the point where they could quickly and accurately give any of the German expressions in response to the English equivalents and to respond in German to German questions based on the dialogue. Frequently the class was divided into small groups with one student in the group serving as the leader. In the second semester the dialogue material was used as the basis for short impromptu conversations carried on in small groups and monitored by the teacher.

A textbook containing the dialogues of the films and English translations of the dialogues of the films and English translations of the dialogues was also used in the course. It was supplemented by grammatical materials and exercises developed as a part of the project. These supplementary materials were designed to give the student in this audio-visual approach a control over grammar and syntax equal to that attained by the student in the standard first-year course. Each unit of the Supplementary Grammar and Workbook corresponds to a segment of the Guten Tag film and is organized around the vocabulary and grammar items of the segment's dialogue. Some

class time was devoted to the introduction of this material and to clearing up questions about it after it had been studied outside of class time used for it.

Since the materials described above provide very limited practice in reading and since the acquisition of a reading vocabulary of about 3000 words is normally expected from a first-year German course, a cultural reader (Im Wandel der Jahre) was also used. Shortly after the mid-point of the first semester and continuing through the remainder of the course, a short reading section was assigned as a part of each weekly instructional unit. No classroom time was devoted to discussing, reading, or translating the reading section unless the students raised questions about specific points. The students' comprehension of the material read was checked through their written responses to 15 written questions on each section. All of the questions were given in German. Answers were given in English to 10 of them and in German to 5.

At frequent intervals short quizzes were given to measure the students' control over the dialogue material and over basic grammar and syntax. Longer tests were given in the middle of and at the end of the semester.

EVALUATION

A preliminary evaluation of the project was made at the end of the first semester by giving the reading portion of a standard examination, prepared by the American Association of Teachers of German, to the students in the audio-visual course and to a comparable number of students in standard sections of first-year German. The average score of the audio-visual section students was 17.93; that of the standard section students was 21.75. Since the latter had had considerably more reading practice at this stage the difference of 3.82 in their favor was not unexpected. The listening portion of the test was not given at this time becuase the teachers of the standard sections were not able to work it into their schedules.

One of the most important goals of the project -- stimulation of beginning students' enthusiasm for learning German -- was, in a sense, attained but, in a way, missed. Responses to a questionnaire administered at the end of the semester indicated unqualified enthusiasm for the approach and for continuation with it. It was not unusual for a student to stop after class and make glowing laudatory comments about the films and about the approach being used in the course. It was also not unusual for such a student to disappear from the class a few weeks later without ever having indicated any change in his attitute. Attrition rates in a wide variety of classes throughout Memphis State were unusually high during the 1975 fall semester, often in excess of 50 percent, according to report. The attrition rate in the standard sections of beginning German was of this magnitude, and this was also true of the audio-visual sections.

To provide the basis for a final evaluation of the project the reading portion and the listening portion of the standard examination used at the end of the first semester were administered at the end of the year to the audio-visual students and to a group of students in the standard course. (The examination does not have a section which tests speaking ability.) The average score of the audio-visual students on the listening portion was 20.6; that of the standard section students, 19.5. The average score of the audio-visual students on the reading section was 27.1; that of the students in the standard sections, 27.4. Evaluation through this test thus shows no substantial difference in the performance of the two groups in the listening and reading (including grammar) areas.

CONCLUSIONS

On the basis of the evaluation made at the end of the project, it is evident that the first of the goals listed at the beginning of this report -- improvement of the first-year student's ability to understand German spoken by a variety of native speakers -- was not attained. (It is, however, somewhat reassuring to find that the classroom teacher's use of German in the standard sections, along with the student's listening practice in the language laboratory, gives the student good ability to understand the spoken language.) It is not possible, at this point, to say on the basis of a test, that the second goal listed -- improvement of the first year student's ability to express himself in spoken German -- was attained; but subjective impressions indicate that it was. The Guten Tag film itself testified to the attainment of the goal of a more direct contact with everyday life in Germany since the students see real people and experience Germany with them. As for the goal of stimulating the student's enthusiasm for learning German, the evidence for this is strong despite the fact that it is not reflected in a lower attrition rate than that found in the standard sections. The results of the project do provide good evidence that an approach which devotes a relatively small proportion of classroom time to working with grammar and which puts the student largely on his own in developing reading skill does lead to a solid general foundation in the language. At the very least, it can be said that the audio-visual course based on the Guten Tag film provides an attractive and academically sound alternative approach to that of the standard first-year course.

FOLLOW-UP TO THE PROJECT

Audio-visual sections using the Guten Tag film will be offered again in the 1976-1977 academic year. Supplementary vocabulary and conversations will be developed around the dialogue of the film sections in order to increase the student's range of listening comprehension and to give him greater flexibility in expressing himself in spoken German. At the end of the year a standard test will again be administered to the audio-visual group and a comparable group from the other first-year sections. Both groups will be tested for speaking ability, as well as for listening and reading comprehension. This evaluation should provide an adequate basis for a decision about expanding the audio-visual approach offerings at the first-year level and, possibly, using a similar approach at the second-year level.

PROBLEM PREGNANCY: SOURCES OF HELP

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and
David J. Anspaugh, Department of Health, Physical Education and Recreation

Memphis and Shelby County continue to be plagued with the problem of an ever increasing number of women experiencing unwanted pregnancies. More and more community agencies are called upon to assist the woman in this situation. The personnel needing accurate, up-to-date information regarding services available to assist the woman may be in a variety of work settings with a variety of backgrounds.

The Department of Guidance and Personnel Services and the Department of Health Education are both involved in training persons to be able to direct clients to appropriate agencies for help or to provide immediate information. The need for a complication of local information was recognized, especially in view of the recent changes in the law regarding abortion and family planning in Tennessee. The only materials available in the Brister Library were out dated and of a national perspective rather than local.

A slide presentation was chosen as the delivery vehicle as it was inexpensive, easy to operate, and easily up-dated. The latter feature was especially important in view of the rapidly changing available services and agencies.

The approach taken was to explore various alternatives open to the woman with a problem pregnancy and specifically to look at abortion as a rational alternative. The abortion alternative was explored in more detail due to the prevalent inaccurate information regarding it, and the mystique surrounding it. Other alternatives evoke less emotion and are more readily discussed and understood.

This slide presentation will be used in introductory courses in Guidance and Personnel Services, Health Education, and will be available in the Learning Media Center in Brister Library for other students, classes or community use. It has value not only for the person who might be dispensing the information to others, but who might be in need of the information themselves. Thus, it might have limited uses with teen groups and other groups in a variety of educational settings.

PROCEDURE

The subject matter to be covered was outlined and the script written. Then a decision was made regarding a slide to depict each segment of the script. Some areas were depicted in graphic form, others with photographs. Some of the slides were duplicated from other sources, with others being either photographed or drawn. A 3M slide cartridge with the sound on the individual slide was chosen so that changes could be made easily and the material kept current.

Paramount in our thinking was the idea that the information should be presented objectively and non-judgmentally. At no time did we attempt to push one solution or alternative over another one.

EVALUATION

At this time the material has not been used in a classroom but will be introduced for the fall semester. The undertaking was a larger task than was expected by the authors, and it took a great deal more time to organize and execute than was anticipated.

Not all of the pictures are of the quality desired; that is, some do not do as good a job of illustrating the facts presented as they might. However, as the material is updated, some improvement can be made. Additionally, it is possible that some areas of the presentation may be expanded to portray a more comprehensive look at a particular service.

IMPLEMENTATION OF AUDIO-TUTORIAL METHODS IN COLLEGE ALGEBRA

Hugh L. McHenry, Department of Mathematical Sciences

The audio-tutorial method used in the present project is an instructional delivery technique in which a book is designed to correlate with audio tapes. Lectures and other explanations are put on audio tape, and the chalkboard illustrations normally used in the classroom are put in the text. The student reads the text at the same time that he is listening to the tapes. Study exercises are usually located throughout each unit of study for the student to use in checking his progress.

Most students in mathematics are accustomed to the traditional lecture-textbook method where they read a certain section in the text, go to class to hear a lecture on the material then are left to try to work the exercises. A number of problems are encountered with this situation. First, most students have difficulty reading a mathematics textbook; second, once the classroom lecture is over, the chalkboard is erased and the explanatory lecture is lost; and third, many students have great difficulty working the homework assignment several hours after the lecture. The audio-tutorial method of studying mathematics is an attempt to remedy the defects of this traditional lecture-textbook method.

PROJECT OBJECTIVE

The purpose of this project was to arrange for the necessary materials, facilities, and services to implement the audio-tutorial program for teaching intermediate and college algebra that was developed, tested, and used by Joseph Newmyer, Jr. and Gus Klentos at Fullerton Junior College, Fullerton, California.

When results from using the program at Fullerton and a number of other schools indicated that this technique greatly improved study habits and led to a better understanding of mathematics, the Charles E. Merrill Publishing Company published the textbook and tapes for the program. The book contains 29 units and each unit has one side of an audio cassette tape, about 30 minutes long, to go with it. There are 15 tapes altogether. Experience indicates that it takes about 90 minutes for a student to work through a unit. That is, the program requires about 43 hours for the average student.

There are four requirements for the implementation of this program: (1) A specially equipped classroom with a cassette tape player for each student, (2) An adequate number of copies of each of the tapes, (3) A testing program, and (4) A handbook for students explaining how to use the system. Therefore, the specific objectives of this project were to see that these four requirements were met for the implementation of the Newmyer-Klentos audio-tutorial program for teaching intermediate and college algebra at Memphis State.

REQUIREMENTS SATISFIED

Arrangements were made that satisfied each of the requirements for implementation.

Classroom Need

An appropriate classroom was set up through the joint efforts of the Mathematical Sciences Department and the Educational Support Program (ESP). A classroom adjacent to the ESP Mathematics Center in the Mathematics Department was allocated by the Department for use as an audio-tutorial classroom. Tables with electrical outlets were moved into the room and a door was put in connecting the ESP Mathematics Center and the Audio-Tutorial Classroom. An agreement was also worked out whereby the Audio-Tutorial Classroom could use the cassette tape players available in the ESP Mathematics Center. The result was a facility that could accomodate up to 32 students at one time.

Need For Copies of the Tapes

Since the audio-tutorial system assumes that each student will have his own tape and text, several copies of each tape had to be available at any one time. This need was satisfied by securing permission from the Merrill Publishing Company to copy the tapes after purchasing one set. The ESP Mathematics Center purchased a set of the tpaes; the Department of Mathematical Sciences purchased a large supply of blank C60 cassette tapes, and the Learning Media Division of the Center for Instructional Service and Research duplicated the tapes. Thirty copies of each of the 15 tapes were made and stored in the ESP Mathematics Center.

A student using the Audio-Tutorial Classroom must enter through the ESP Mathematics Center. On his way through he picks up a cassette player and whatever tape he wishes to use and returns them as he leaves. In this way the clerical chores are handled by the ESP Center instead of the instructor or a special Audio-Tutorial Classroom clerk.

Need for a Testing System

The Newmyer-Klentos audio-tutorial system for algebra requires that a test be taken at the end of each unit of study and used by the student to judge his progress. Module tests covering four to five units are also given and used to assign grades. The system also allows the student

to retake any test on which he does poorly. There are 29 unit tests and five module tests. In order to allow for retakes, two forms of each unit test and five forms of each module test were prepared. That is, 2x29+5x5 = 83 tests were constructed. All tests were put in the multiple choice format in order to allow for computer scoring.

Copies of each of these tests were put in a test file in the ESP Mathematics Center and were available to students presenting proper identification to the ESP attendant. The ESP attendant supervised the taking of the tests while the instructor handled scoring them and maintaining the students' records.

Student Handbook Need

A handbook was prepared for the student. It was designed to serve as a guide to the audio-tutorial system and its implementation on the Memphis State Campus. It contained the following information:

(a) A description of the audio-tutorial method
(b) A recommended work schedule
(c) A description of how to use the services of the ESP Mathematic Center
(d) Directions for taking tests
(e) An explanation of how grades would be determined
(f) An encouragement to check with the instructor frequently for progress reports.

RESULTS

The Newmyer-Klentos audio-tutorial system for teaching algebra as published by the Charles E. Merrill Publishing Company was implemented in five different settings during the 1975-76 school year. Each of the implementations was in the form of a pilot project in which the major objective was to identify the main parameters associated with the system at Memphis State. No attempt was made at controlled research in this first phase. Plans are now being drawn up to study the main issues that have arisen in the audio-tutorial system. A brief description of each of the uses that have been made of the system follows.

A Completely Individualized Format

In the fall semester of 1975 and again in the spring of 1976 one section of college algebra was listed in the schedule of classes as an individualized class using audio tapes. Twenty-seven registered for the class in the fall and twenty-five in the spring.

Each one who registered attended an orientation session in which the program was described and each person given a handbook for the class. It was particularly emphasized that each student would be on his own in determining when and where he would do his work. The procedures for checking out the tapes in the ESP Mathematics Center were explained. The services of the ESP Center were also explained and the students strongly encouraged to use the Center for help at all times.

The students were given the home and office numbers for the instructor and told to call him at any time they had a need. The instructor also handled the grading of the tests. All test results were reported to the students in written reports send to them by mail.

About 10% of the students finished the course by the end of the school year while 50% dropped the class without ever taking the first test. The other 40% received T grades and are at various point along the way toward completion.

These results indicate that major revisions are needed for the system to be successful in a completely individualized setting. Such revisions are now under way.

Individualized Work with Classroom Attendance

One section of college algebra was offered in the fall of 1975 in which students used the audio-tutorial materials in an individualized and self-paced arrangement but were required to come to the Audio-Tutorial Classroom on a regular class schedule to do the work.

The rationale behind this effort was that the student has come to depend upon the traditional class schedule to tell him when to do his work. Consequently, class attendance should facilitate progress in individualized and self-paced classes.

Thirty students registered for the class. Sixteen finished by the end of the semester and four others are still active.

Now that some experience has been obtained in using the audio-tutorial method, it is felt that this arrangement can be made quite successful. Therefore, another section of the same course is scheduled for the fall semester in 1976 in which a greater effort will be directed toward getting more students to stay with the course.

A Supplement to Regular Classwork

Since the audio-tutorial program was available in the ESP Mathematics Center, it was possible to send students from regular classes to the Center to use the program. Therefore, one instructor was assigned to teach two sections of college algebra in order to investigate this potential use of the audio-tutorial program. One of his classes was regularly sent to the Center to do the programs that repeated what was done in class. The other class was given extra problems assignments in order to have them invest about the same time in extra efforts as was required in doing the audio-tutorial units.

The two classes showed no significant difference in class averages on a pre-test and on the first hour test. However, on the three subsequent hour tests and the final the audio-tutorial users had class means from five to fifteen percentage points above the nonusers. Although these differences were not statistically significant, the consistent superiority

of the audio-tutorial class suggests that the differences may be of practical importance. At this point there is sufficient evidence to merit a serious investigation of this way of using the audio-tutorial materials.

An Aid in Overcoming the Language Problems of Foreign Teaching Assistants in the Classroom

A number of foreign students teach classes as teaching assistants in the Mathematical Sciences Department. Quite frequently there is a language problem. Therefore, a pilot effort was organized to see if the audio-tutorial system could be used to overcome some of these language problems.

Two such teaching assistants were each assigned two sections of college algebra in the spring of 1976. Each taught one of his classes in the traditional way while all of the lectures in the other classes were handled by the audio-tutorial program.

The audio-tutorial classes contained 52 students and the traditional ones 74. An analysis of the grade reports filed by the instructors shows that 66.0% of the audio-tutorial classes made grades of A, B, or C while 55.4% did so in the traditional classes. Also, 33.8% of the students who enrolled in the traditional classes either dropped or withdrew and 28.8% in the experiemntal classes. Although the differences here are on the borderline for statistical significance, they are considered to indicate that this use of the audio-tutorial method should be seriously studied.

Study Materials in the Mathematics Center of the Educational Support Program

The Mathematics Center of the Educational Support Program is operated in the Mathematical Sciences Department to help any Memphis State student who has a mathematics problem. Requests are frequently received that call for extensive help on topics in mathematics. Consequently, the audio-tutorial materials were placed in the Center so that they might be available to any student upon request. The materials are in constant usage in the Center, and a number of students have come to depend upon them for regular assistance with their courses.

CONCLUSIONS

All but the first implementation of the audio-tutorial system for teaching algebra mentioned above seem to indicate that the system has something to contribute to the study and learning of mathematics at Memphis State. Therefore, extensive study and serious implementation of the audio-tutorial method in all pre-calculus mathematics courses are underway. It is anticipated that a number of controlled experiments will be conducted.

SELF-STUDY PROBLEM MODULES IN PHYSICS FOR ENGINEERING AND SCIENCE MAJORS

Robert R. Marchini, Department of Physics

The failure-withdrawal rate in the introductory calculus-based physics courses for engineers and science majors (Physics 2511-2512) has been alarmingly high in recent years. On the average, 49% of the Physics 2511 students and 43% of the Physics 2512 students either failed or withdrew during the period from September, 1973 to January, 1975.

Undoubtedly, this lack of success rate is due in part to the advent of the late drop date. Unfortunately, this source of student difficulties is a constant and cannot be attacked from within the department. More important, however, is the increased demand on the time of the instructors involved in the course. Increased teaching loads and the loss of student assistants have lessened the ability of teachers to check student progress. In the past, work-study students have been available to grade the students' homework. These work-study students are no longer available and thus the homework problems assigned often are not graded. Examinations have become the only method of evaluating student weaknesses in problem solving. This process leaves little margin for error on the part of the student.

The number of example problems that the instructor can work in class is limited by the tremendous amount of theory that must be covered in the course. In addition, it is difficult for the instructor with years of experience to work the problems in a manner which can be understood by a student seeing such problems for the first time.

APPROACH

For the above reasons, it seemed desirable to make available to the student a set of problems which the student could attempt and then, independent of the course instructor, look at detailed solutions of the problems. The worked problems should be kept at a location accessible to all students when the students need them.

It was proposed to prepare problems and the solutions of the problems for twelve different physical concepts covered during the first semester of the course. Furthermore, the problem solutions were prepared in

single logic steps in an attempt to give the student some insight into the physicist's method of attack on the problem. The format chosen to display these worked examples was filmstrips. It was felt that the student's attention would necessarily be restricted to the particular step in view.

The mechanics of this module approach was quite simple. The instructor would hand out a problem sheet for a particular concept (i.e., rotational dynamics) before lecturing on the material. The students would work on the problems at their convenience. The filmstrips containing the solutions to the problems were kept in the Learning Media Center in the library and could be checked out by the students both to grade their work and to see the complete solutions to problems they were unable to do.

The concepts covered were particle kinematics, motion in a plane, Newton's laws, circular motion, work and energy, momentum, collisions, rotational dynamics, statics, oscillatory motion, gravitation, and wave motion. These concepts are so fundamental to this type of course that they will be covered in every book although the order of the topics may differ from book to book.

EVALUATION

Evaluation of the project was done by keeping a record of student usage, comparing failure-success rates with previous classes and by a simple student opinion.

The students were required to sign for the filmstrips and the records were kept by the staff at the Learning Media Center. The usage records indicate that the students felt the filmstrips were helpful. The filmstrips were used more than any other item in the Center collection, other than shorthand cassettes. It is also true that more students used the filmstrips than indicated by the sign-out sheets. Quite often, several students shared the filmstrips, but in such cases only one student would sign for the filmstrips used. During the first semester, the filmstrips were used approximately 800 times.

At the end of the semester, the students were asked to express their opinion of the problems modules. An overwhelming majority of the students responded favorably. The principle objections of the students were the long waits to use the materials and the lack of a similar system for the second semester.

The most important part of the evaluation process is that which is related to student performance. The failure-withdrawal rate for the course, which had been averaging 49% for the two previous years, fell to 24% of the original 114 students enrolled. The four instructors in the course felt the modules were responsible for this improvement in the student success rate. Although this is not a large enough sample to draw any definite conclusions, there must be some reason for this startling improvement. Projections of this lack of success rate for the present semester seem to be encouraging.

FOLLOW-UP TO THE PROJECT

The future of this approach seems obvious. As funds become available, problem modules should be produced for Physics 2512 and for the non-calculus introductory courses Physics 2111 and Physics 2112. An adequate number of copies should be made in response to the student demand.

PART IV

ORGANIZATION AND MANAGEMENT OF INSTRUCTION

INTEGRATION OF PRINT AND NON-PRINT MATERIALS WITH COURSE OBJECTIVES

Frank W. Markus and Anwar Faily, Department of Educational Administration and Supervision

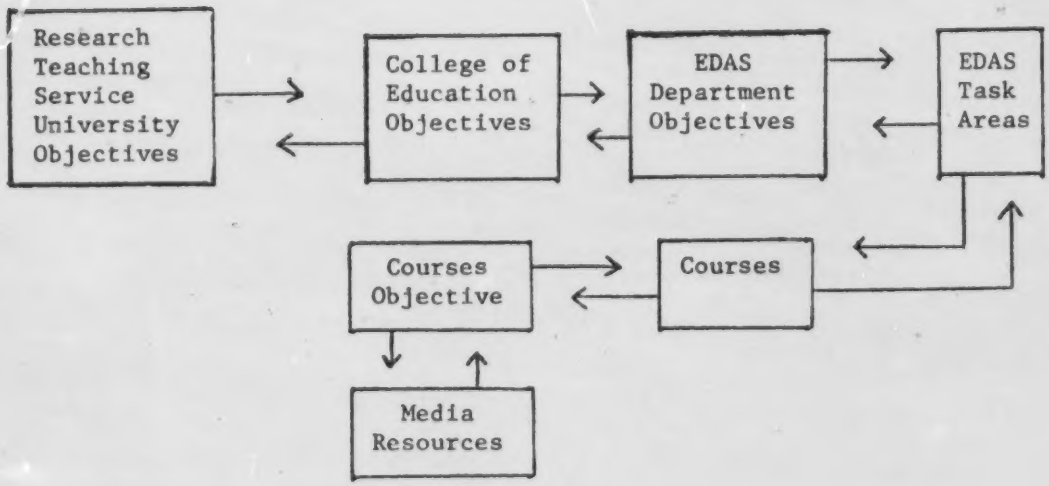
The purpose of the project was to enhance learning and self-directed study by the development of a system that integrates Education Administration and Supervision (EDAS) course and learning objectives with immediate access to the most appropriate print and non-print materials.

PROJECT PROCEDURES

EDAS course objectives and task areas are designed to support and be consistent with College of Education objectives and University objectives. The EDAS Department has organized departmental resources to correlate with course objectives as shown in the flow chart below.

FIGURE 1

SUPPORT SYSTEM FOR UNIVERSITY OBJECTIVES



The resources, organized into a media retrieval system, assure that students be aware of, as well as understand, the relationship between (1) course objectives, (2) task areas of educational experiences, and (3) available media.

The EDAS faculty has formulated course objectives, identified task areas of educational experiences for the students and organized their utilization with departmental offerings. The educational growth of students will be enhanced by providing a meaningful link between the course objectives and access to the most appropriate print and non-print materials.

The faculty establishes the basis for evaluating student achievements in various learning activities in accordance with course objectives formulated for various classes. This process is designed to prevent students from wandering meaninglessly through experiences and activities which lack appropriate and adequate evaluation. Evaluation of learning experiences should be designed to measure the degree of achievement of the desired behavior. Maximum effectiveness in this approach requires selecting and integrating appropriate media to aid in achieving specific course objectives.

The EDAS approach to facilitate learning is the systematic organization and categorization of EDAS departmental media in accordance with objectives of departmental courses. Subsequent effective utilization of the media will promote and facilitate maximum learning. The media are catalogued according to the various specific task areas identified in EDAS. In addition, students and professors may easily identify appropriate print and non-print materials available to enrich class and out-of-class learning experiences and to contribute to the achievement of all course objectives.

Records of both print and non-print materials among other things are kept to assure a proper perspective of the project. A survey was conducted among the EDAS faculty to determine the most practical locations for the storage and dissemination of media and related materials (including books and journals). One of the conclusions drawn from the survey data was the EDAS media be stored in the Learning Resources Center of the Ball Education Building. The Center would provide centralized storage and retrieval accessibility for EDAS faculty and students. Additional survey results, which are self-explanatory, are listed in Figure 2.

Competency or task areas were identified for department courses by administering a second survey instrument. This instrument included predominant themes (or tasks) which are generally considered to be included in EDAS instructional program. The degree of emphasis in the course of each task was a determining factor in classifying materials for each course objective (See Figure 3).

PROJECT IMPLEMENTATION

The procedure used for the project began with the collection of current

FIGURE 3

Task Areas of Educational Administration and Supervision

I. Tasks of Administration

- A. Curriculum and Instruction
- B. Finance and Business Management
- C. Legal Responsibility
- D. Pupil Personnel Services
- E. School-Community Relations
- F. School Plant and Services
- G. Staff Personnel
- H. State and Federal Funding Programs
- I. School Boards

II. Administration Process and Organizational Variables

- A. Building Morale and Climate
- B. Communication
- C. Goal Setting
- D. Initiating Change
- E. Decision-Making
- F. Negotiating
- G. Planning and Organizing
- H. Resolving Conflicts
- I. Supervision and Evaluation

III. Societal Factors Influencing Education

- A. Automation, Science, and Technology
- B. Church-State Relations
- C. Economic Development
- D. Governmental Relations
- E. International Relations
- F. Minority Group Relations
- G. Population Trends
- H. Social Class Structure and Mobility
- I. Politics

IV. Programs for Educational Administration

- A. Certification
- B. Curriculum
  - 1. Preparatory Program
  - 2. Courses
  - 3. Objectives
  - 4. Research
- C. Field Experiences and Internships
- D. In-Service Education
- E. Instructional Materials and Methods
  - 1. Textbooks
  - 2. Simulation
  - 3. Cases
  - 4. Role Play
  - 5. Workshops
- F. Professionalization
- G. Recruitment
- H. Research
  - 1. Methodology
  - 2. Course
  - 3. Studies
  - 4. Surveys
- I. Selection
- J. Theory Development
  - 1. Bureaucracy
  - 2. Climate
  - 3. Leadership
  - 4. Complex Organizations

V. Philosophical and Sociological Foundations

- A. Philosophy
- B. Perception

VI. Psychological and Sociological Foundations

- A. Perception
- B. Roles
- C. Personality

FIGURE 2
DEPARTMENT OF EDUCATIONAL ADMINISTRATION AND SUPERVISION
DETERMINATION OF
THE MOST PRACTICAL LOCATION FOR STORAGE
OF EDAS MEDIA AND MATERIALS

This is a study to determine the most practical location of audio-visual aids (including books and journals). The number of professors/respondents were ten.

Using the scale specified, evaluate the factors with reference to storage/dissemination locations. The factors refer to EXISTING conditions. Try to disregard personal preference and be as objective as possible.

SCALE: 5 High evaluation
4
3
2
1 Low evaluation

	OWN OFFICE - 19%	LEARNING MEDIA CENTER - 32%	EDAS STOREROOM - 21%	ONE CLASSROOM - 13.5%	CLASSROOMS-COURSES - 13.4% RESPECTIVELY	RESPONSE TOTAL
ACCESSIBILITY	24	29	20	11	9	93
SECURITY	19	27	22	7	6	81
SPACE	6	24	14	17	17	78
STORAGE FACILITIES (Shelves, etc.)	7	19	13	14	14	67
Lack of Interference (Disturbance with other activities)	15	28	17	12	13	85
ACCOUNTABILITY	21	29	18	8	6	82
ECONOMY (Personnel, duplication or potential thereof)	18	30	19	9	12	88

EDAS course objectives and the identification of task areas and appropriate materials for each oucrse. The latest course objectives were obtained from each EDAS course syllabus and the course descriptions found in the 1975-76 MSU Graduate Bulletin.

Thus far, objectives have been collected from the EDAS syllabi and individual professors for twenty courses. These objectives have been correlated with available resources and incorporated into the system. Some newly offered courses in EDAS utilize materials from EDAS professors' private libraries. Some EDAS courses have less structured course objectives to meet specific individual student needs, e.g., readings, research problems courses, and internships. These courses were not included in the retrieval system.

The materials catalogued by competencies or task areas and objectives include an alphabetical listing of materials available as resources for EDAS faculty and students. Incorporated in the listing is an annotated description of each resource. The description and number of materials presently included in the system are as follows: books--141; dissertations--25; films--11; tapes or tape cassettes--67; pamphlets--27; articles --101; miscellaneous--41; annotated material cards--413; material cards matched to course objectives and task areas--approximately 2,000. Samples of the index system used for the project for EDAS department resources are presented in Figure 4 and Figure 5. Procedures for faculty and student use are as follows:

1. Locate card file in Learning Resource Center which contains course objectives, lists of correlated materials, and task areas.

2. Identify desired Lead Card (course title card) (See Figure 4)

3. Pinpoint specific objectives of course or task areas of course about which information is desired

4. Locate Material Card, matched to selected course objectives, with listing of correlated materials (See Figure 5)

5. Locate specified needed material in Learning Resource Center according to legend on material card

6. If title of material is known, use master alphabitized listing, in Learning Resource Center, to locate materials needed

7. If study of materials relating to particular task area is needed, use master list of task areas which has numerically sequenced materials listed for each task area.

FIGURE 4

LEAD CARD (Course Title Card) Format Sample

EDAS 7160/8160 Card 1.

ADMINISTRATION OF SCHOOL PERSONNEL AND NEGOTIATIONS

Course Objectives:

I. To acquaint the student with the areas of concern that are generally considered a part of personnel work.

II. To acquaint the student with the problems and techniques involved in recruitment and training of school personnel.

III. To acquaint the student with the problems and techniques involved in personnel morale and motivation.

IV. To acquaint the student with problems and techniques involving salary and pay of school personnel.

V. To acquaint the student with administrative clerical and record devices used in personnel administration.

IV. To acquaint the students with various retirement systems with which personnel administration need to be familiar.

VII. To acquaint the student with the legal and ethical responsibilities of school personnel.

VIII. To acquaint the student with the various types of of contracts including specific reference to the Tennessee Tenure Law.

FIGURE 5

EDAS MATERIAL CARD SAMPLE

EDAS 7160/8160 Card 2

Objective 1. To acquaint the student with the areas of concern that are generally considered a part of personnel work.

Materials	*Material Type	Task
Critical Incidents in Negotiation	B	Staff Pers. Negotiating
Directions in Staff Relationships	TC	Staff Pers. Making Decs.
Fermentation in Decision Making	TC	Making Decs.
*Management by Objectives & Results (1-LRC)	B	Staff Pers.

*Materials Legend

B - Book

D - Dissertation

F - Film

M - Magazine or Journal

P - Pamphlet

T or TC - Tape or Tape Cassette

EXAMPLE OF SYSTEM UTILIZATION

A student enrolled in "Administration of School Personnel and Negotiations", (EDAS 7160/8160), desires more information concerning a specific course objective (Objective I--to acquaint the student with the areas of concern that are generally considered a part of personnel work.)

The student makes use of the EDAS reserve area in the Learning Resource Center in the following manner:

1. Student locates Lead Card in EDAS Materials File containing course number, course, title, and course objectives (See Figure 4)

2. After locating the Lead Card and identifying the specific course objective about which more information is desired, student locates Material Card (See Figure 5) which is filed immediately following Lead Card. Listed on the Material Card are: specific course objective to which materials are related, materials title, related EDAS task area emphasis, and material location

3. Student identifies material titled "Management by Objectives and Results," a book located in the Learning Resource Center that relates to Objective 1 (See Figure 5).

SYSTEM BENEFITS

The Specific benefits of the system for faculty are:

1. Improved organization of available curriculum resources
2. Facilitation of a more efficient retrieval for EDAS resources for classroom use
3. Increased awareness of any inadequacy of materials in a given area and imbalance in the distribution according to a course and course areas
4. Increased awareness of the variety of materials available to enhance learning relating to specific course objectives.

The specific benefits for students are:

1. Provisions for more and varied learning options
2. Opportunities to develop initiative in self-directed learning
3. Opportunities to utilize EDAS resources in a centralized location
4. Provisions for supplemental and remedial use of EDAS materials relating to specific course objectives.

CONCLUSIONS

Future refinement of the system requires additional organization of media by subject matter. Such organization will continue to identify the correlation of media subject matter related to more than one EDAS course. Faculty members and students in other departments will have easier access to all EDAS resource materials. Organization of media by subject matter will provide a means whereby faculty members could utilize broad application of available materials and easily observe overlap in available materials. This system should also provide a means of insuring a broad range of educational activities to enhance learning.

Update of the system will require maintenance tasks. Continuous review of present materials to ascertain task area applicability should be conducted.

The expected improvements that will be realized from the project are:

1. Improved organization of available curriculum resources
2. Facilitation of a more efficient retrieval system for EDAS learning resources
3. Provisions for more options to the student and increased educational activities and self-directed learning
4. Awareness of any inadequacy of materials in a given area and imbalance in the distribution according to courses and course areas.

This material storage and retrieval system should be further implemented into a Learning Resource Center for EDAS materials additional space and facilities provided for reading, listening, and viewing of the materials either within the Center or on a checkout basis. A brief newsletter should be issued periodically to inform faculty and students of current materials and to receive their recommendations for future acquisitions.

Students and faculty will reap the benefits of a well organized resource system that provides more educational options and increased opportunities for self-directed learning. All these efforts are aimed at broadening classroom learning experiences and fulfilling the educational objectives of Education Administration and Supervision.

FACILITATING ACCESS TO GEOLOGICAL MATERIALS

Laurence E. Lackey, Department of Geology

An individualized laboratory was designed and implemented for the first term geology course (physical geology). Each laboratory unit and the structure of the laboratories as a whole were intended to develop specific competencies in geology as well as transferable skills, those skills useful in many fields. The development of the laboratories under a seed grant is a step toward a competency based geology course.

PROJECT GOALS

Transferable skills are those skills which are useful in more than one field, such as the ability to analyze and solve problems or to communicate effectively. It is the development of these skills, rather than the mere acquisition of facts, which will be of greater value to the student in the long run and is, therefore, the more important educational goal. Important among these transferable skills are the ability to work independently, apply knowledge already understood and know how to obtain more information when that is necessary. The way to develop these abilities is by applying them, and the purpose of this seed grant project is to facilitate student access to geological materials and encourage the development of these transferable skills.

This project is intended to assist the student develop by practice increased:

1. Ability to work independently and set goals
2. Maturity in decision making
3. Interest in and desire to continue learning about geology
4. Retention of course material after the end of the term compared with previous practice.

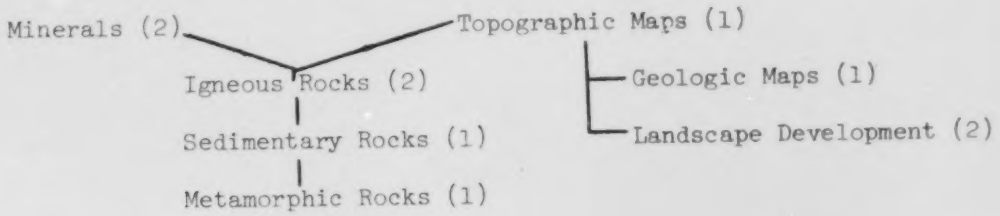
To achieve these increased student abilities, the following goals are proposed for the course and instructor:

1. Matching course content as closely as possible with student interests
2. More efficient use of students' time

3. Increased personal contact between students and instructors
4. Specified goals for student achievement
5. Increased student interest in laboratories
6. More intimate relationship of the laboratory to the rest of the course.

COURSE STRUCTURE

As a step toward a competency based geology course students from one of the physical geology lecture sections were offered the opportunity to work at their own pace competence based audio-tutorial laboratory materials instead of attending the regular laboratory sections. The core of each unit is a tape-slide presentation tied to specimens and maps. A mimeographed hand-out for each laboratory unit includes an introduction, objectives, tape outline, exercises and review. To begin the program the topics for the standard laboratory sections were chosen for the individualized laboratories; however, students could complete the units in any sequence, subject to the following tree:



After completing the tape-slide narrative and laboratory exercises, the student takes a quiz on the material at either a basic or advanced level. Each unit quiz may be repeated (in one of several versions) until the material is mastered; the number of units successfully completed within three attempts determines the student's laboratory grade. Mastery of a unit at the basic level earns three points, at the advanced level five points. The minerals, igneous rocks and landscape development units earn double credit because they are longer. A grade is determined according to the following scale:

A 44 - 50
B 37 - 44
C 30 - 37

RESULTS

Six students of a class of thirty decided to do the individualized laboratory units. One of these dropped the course; at the time he dropped, he had a course grade of C and had completed two laboratory units. The others completed all the individualized laboratories; three received A's, one a B and one a C for the laboratories. There was a great range in student achievement. Two of the students taking the individualized laboratories were among the top four in the class as a

whole. (One of these intends to become a geology major). Two students received B's as course grades, one of whom had been on academic probation. One student received a D course grade and might have failed except for his C in the laboratory. The results suggest three classes of students who benefit from the individualized materials:

1. Those well prepared students able to complete the work in a minimum of time

2. Students who become interested in a subject because of a chance to work at it on their own - one of the students who received a B has expressed an interest in becoming a geology major

3. Those poorly prepared students who need a slower pace and multiple chances. It is interesting that the student with a D course grade did much better on the laboratory quizzes than on the lecture tests. Later in the term that person also passed units on the first attempt instead of requiring several.

Some students say they do not like listening to a tape, but reaction to the individualized units as an option was favorable. Students who missed their regular laboratory sections used the individualized units as a make-up and some students who did not like their laboratory instructors completed the individualized laboratories even though they had to take the regular laboratory tests.

RECOMMENDATIONS

Tapes should not exceed 20 to 25 minutes running time, and there should be one or two visuals per minute. Students appreciated a feature which automatically advanced to the next slide. Students can only prepare for an average of one quiz per week. It, therefore, may be necessary to combine shorter units. It is essential that the laboratory be staffed so that questions can be answered promptly. Such an arrangement also encourages students to take quizzes. When a student has to seek out a professor in order to take a quiz, the quizzes are put off to the end of the term, creating a problem for some.

INTERDISCIPLINARY COURSE

RENAISSANCE ART, LITERATURE, AND MUSIC

Caroline Fruchtman, Department of Music
Harry C. Cotham, Department of English
Morris K. Perinchief, Department of Art

In the fall of 1974 Dr. Raymond Lynch of the Music Department suggested that Music 4131, Comparative Arts, be conducted as an interdisciplinary course. He and Dr. Robert Snyder, department chairman, proposed the idea informally to Dr. Osborne and Dr. Johnson, chairmen of the English and Art Departments. A general agreement was reached that Harry Cotham of English, Carol Fruchtman of Music, and Morris Perinchief of Art would team-teach a course on Renaissance studies.

Dr. Lynch turned the project over to Carol Fruchtman. With the approval of the instructors and the support of Dr. Snyder, Dr. Fruchtman requested a seed grant from the Center for Instructional Service and Research to provide financial assistance in planning and teaching the course for the fall semester, 1975. During the summer the three instructors formulated the course syllabus, prepared the book list, and agreed upon a tentative list of artists and musicians.

The three-hour course was cross listed in the fall bulletin as English 3212 (The Sixteenth Century), Music 4131 (Comparative Arts), and Art 4622 (Workshop in Art). Since the course was intended for upper division majors in one of the three disciplines, it was decided that each teacher would be responsible for presenting a specific number of lectures. All three instructors would be present at each class meeting and would participate along with the students in class discussions. Sixteen students enrolled; twelve in English 3212 and four for Music 4131.

The following is an illustration of the procedure followed for the first eleven class sessions and represents the structure for the semester's work:

Humanism
Over-view of literary genres in Italian literature (idyl, ecloque, pictoral, elegy, lament) with emphasis on influence of Petrarch.
Cotham - 2 lectures

Humanism and Art
Slides illustrating selected works of Giotto, Duccio, Masaccio, Alberti, Donatello, and Brunelleschi; new techniques of painting; pictorial representations showing influences from classical antiquity, Christianity, and humanistic trends in literature.
Perinchief - 5 lectures

Northern Musicians in Italian Courts
Selected works from early Renaissance composers Borlet and Dunstable demonstrating techniques of composing comparable to trends in early Renaissance painting. Texts and music for vocal works by composers Dufay and Isaac showing link with philosophical and poetic ideas already discussed in previous lectures.
Fruchtman - 3 lectures

Test
Two discussion questions requesting the student to explain correlative aspects of early Renaissance literature, art, and music. Example: "In Venus and Adonis Shakespeare used lush details of nature and scores of rhetorical devices to give the poem an elaborative, decorative quality. What similarities do you see between this poem and (1) Isaac's Quis dabit and (2) Dunstable's Veni Sancte?"

The Music Department provided records, listening tapes, and music scores for the instructor to use in the classroom and for students to study in the music library. The slides shown in class were also available for use in the Art Department archives. The books purchased by the student (see book list) provided the reading material for the literature requirements. In addition the students heard live music played on clavichord, harpsichord, and lute.

After each class meeting the instructors met briefly to exchange ideas and to plan procedures. Discussions with students were encouraged, especially during the lectures on literature and art. Probably one of the most successful parts of the course was the study of the Courtier, since its contents embraced just those aspects of Renaissance court life stressed in the series of lectures, and the students were stimulated to participate in class discussions.

Some positive results from the course are:

(1) Opportunities for the instructors to learn from one another. Especially valuable were the lectures on painting and sculpture techniques of Florentine artists and the historical-literary background presented in the lectures on Thomas More.

(2) Opportunity for the student to acquire deeper insight into his own discipline through the three-dimensional approach to a selected historical period. A study of the poetry and musical setting of Wilbye's madrigal, "Sweet Honey Sucking

(2) Bee," expands the English major's approach to Elizabethan literature and culture.

(3) Encouragement of students and teachers to consider the classroom a forum for presentation and exchange of ideas.

The third benefit, although the goal of most classroom teachers, was the least successful in this format of planned lectures. The instructors agreed that not enough classroom time was devoted to student participation. Better planning in the future can remedy this shortcoming.

Some of the changes suggested by the instructors:

(1) Reduce the number of topics in the syllabus to allow more class time for questions from the students.

(2) Devote one class meeting every two weeks to group sessions. Each instructor would meet separately with those students wishing to pursue in greater detail topics presented in class lectures.

(3) Better coordination of course content by the instructors. For example, the lute ayres by Campion selected for study by the music instructor were those songs available in the Elizabethan Song Book on the book list and also available on commercial recordings. The English instructor used these song texts also in his presentation of Elizabethan and Jacobean poetry. The students also sang some of the ayres. But this degree of coordination was not always achieved in planning the course content. Selection of materials and of master works can be agreed upon before the beginning of the semester. But a continual planning session must be "built into" the class preparations so that genuine team teaching is possible.

EVALUATION

No attempt was made to elicit a formal student evaluation of the course. Thirteen final grades were given: 2 A's, 5 B's, 3 C's and 3 F's (S.A.). The other three who enrolled officially dropped the course. Attendance was irregular for about half of the students. However, several had to commute from outside the Memphis area, and about twenty-five percent were older students with family responsibilities. The term papers required at the end of the semester indicated that all class members, with one exception, were capable of the type of work demanded.

FOLLOW-UP OF THE PROJECT

The instructors have tentatively planned to offer the course for spring semester, 1977. It seems feasible to cross list as before the course numbers in English, Art, and Music. Dean Robert Hatala of University College has expressed an interest in including the course in the offerings of that college. If that can be worked out, the requirements for admission

should remain as at present:

> Open to upper-division Music, Art, and English majors or by permission of the instructors.

Future plans might include inter-disciplinary courses in both the 4000 and 6000 levels. Subsequent semesters might deal, on a rotating basis, with the Medieval, Romantic, Classic, Baroque, and Contemporary eras. Since both the Music and English courses fulfill requirements for degree programs, the course content should remain structured.

TEXTBOOKS FOR
RENAISSANCE ART, LITERATURE, AND MUSIC, AN INTERDISCIPLINARY COURSE (Art 4622, Music 4131, English 3212)

Castiglione, Baldesar. The Book of the Courtier, trans. Charles S. Singleton. Anchor Books (A-186). Garden City, N.Y.: Doubleday, 1959.

Greenberg, Noah et al., eds. Anthology of Elizabethan Lute Songs, Madrigals, and Rounds, 155; rpt. New York: W. W. Norton & Co., 1971.

Machiavelli, Niccolo. The Prince, trans. George Bull. Penguin Classics (L-107). Baltimore, Md.: Penguin Books, 1961.

More, Sir Thomas. Utopia, trans. Paul Turner. Penguin Classics (L-165). Baltimore, Md.: Penguin Books, 1965.

Sidney, Sir Philip. Selected Poetry and Prose, ed. David Kalstone. Signet Classics (CY-498). New York: New American Library, 1970.

SEQUENTIAL INTERDISCIPLINARY COMPETENCY BASED SCIENCE AND SOCIAL STUDIES MODULES

Bertharene B. Young, Campus School
and
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A national trend is emerging for teacher education institutions to identify instructional alternatives to upgrade the professional preparation for prospective teachers. It is a trend toward competency based teacher education. It can be described succinctly as an instructional approach to education in which students must demonstrate their performance of a particular skill, thus demonstrating competency.

The College of Education at Memphis State is continually involved in program development which includes competency based education as one dimension. Through these development efforts three needs have been identified that must be included in the total professional education program if our graduates are to be successful. The College must find ways to individualize the undergraduate program in order to capitalize on prior experiences of the students. In other words, it must search for and find various methods to give students credit for their life experiences.

Secondly, the College must demonstrate the applicability of competency based education. This will require research and testing of one instructional approach against another. It cannot be assumed that one instructional method is better or more effective than another simply because it has been labeled "newer."

Thirdly, the College must continue and strengthen the interaction among classroom teachers, college professors, undergraduate students and children to ensure that the teacher preparation program has both theoretical and practical applications. That is, the College must seek assurance that what they "preach can also be practiced" in a classroom setting with live, vivacious children.

The program described here was designed to help individualize undergraduate

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[1]Ms. Wilma H. Biggers and Ms. Faye J. Lane participated actively in the earlier stages of the project and contributed significantly to it.

science and social studies methods courses. It also encompasses the development of appropriate curricular materials which incorporate the concept of competency based education as a viable teaching-learning strategy.

METHOD

In order to accomplish the purpose of this study, two conditions were necessary:

(1) develop instructional modules
(2) utilize the modules with children in a classroom setting.

Module Development

The initial development of eight interdisciplinary modules for science and social studies was begun with ten classroom teachers and four professors in a weeklong workshop. The eight modules were designed to have specific outcomes selected for primary (1-4) and intermediate (4-6) grade levels. The following concepts were used as broad parameters for the modules:

(1) animals
(2) maps and globes
(3) plants
(4) electromagnetism.

Each module has a similar format. First, it contains a list of the behavioral objectives that the student must master. An example of the objective is: "The pupil will be able to classify animals according to their habitats, skin covering, and mode of locomotion." These objectives incorporated the generic skills of observation, making inferences, classifying, and recording and interpreting data.

Secondly, each module contains a rationale for activities. The rationale provides some orientation for the activities. For example, in the maps and globes modules students are expected to become "acquainted with the world in which they live through the use of maps and globes. It begins with lines, symbols, and legends, broadening this knowledge to include many types of maps."

Thirdly, each module contains a series of activity cards that outline specific tasks to be performed and list materials that are to be used in the performance of the task.

Workshop

The workshop was used as a vehicle to initiate module development. The sequential objectives were: (1) select concepts for module development, (2) determine module format, (3) identify and establish writing teams, and (4) develop the module.

Upon completion of the workshop, the ten teachers continued their module development until the fall semester when seventeen students (undergraduates) were selected to use the materials in a pilot testing situation. Each student was asked to complete a module of his choice and then to teach a group of children using it. This pilot testing resulted in a number of revisions in the task cards to help ensure that they could be used by children.

ANALYSIS OF USEFULNESS WITH UNDERGRADUATES

To test the applicability of the modules as a means of helping move the undergraduate science and social studies courses toward the use of relevant competencies, twenty-seven students were selected from two classes to participate in the project. Eleven of these students were assigned as the control group and sixteen were assigned as the experimental group to work with the modules and the children. No attempt was made to equate the groups with regard to demographic variables such as age, sex, race, or prior experience. They were simply assigned to classes according to what class would best serve their needs in terms of meeting time. The purpose of this procedure was to normalize the situation as much as possible, because students simply choose their class time in consultation with an adviser then register for it.

Each group responded to a twenty item instrument constructed from concepts and generalizations which were incorporated into the eight modules. The students were asked to choose the best answer to each item from a four-choice multiple answer. The maximum possible score therefore, was twenty and a minimum score was zero. The instrument was given on a pre- and post-assessment basis. On the pre-assessment, the average number of correct responses was 8.6 for the control and 9.1 for the experimental group. The average number of correct responses for the control group was 9.8 and for the experimental group was 12.4 on the post-assessment. These averages suggest that those undergraduates who had an opportunity to work with the modules and children in an actual classroom setting were able to increase their knowledge on concepts and generalizations related to science and social studies.

Student reactions from the experimental group ranged from: "I enjoyed my work with children" to "I think this is a good approach to teaching methods classes." One negative reaction was: "I didn't like the modules, but I think I learned a lot."

CONCLUSION

The purpose of the project was to develop curricular materials that were individualized for determining undergraduate competency-based education as a viable teaching-learning strategy. Consequently, the results obtained are encouraging, but much work must continue. Several elements must be addressed as the work continues.

Is the summer workshop the best approach to curricular development? The ten teachers involved in this project suggest that it is the most convenient time, because they are free from the pressure of the regular school day.

Should undergraduates be involved in program development? Comments and reactions from those students involved in the pilot testing suggest that they should have been involved in the initial writing.

Generally, the project achieved its objectives, but much work remains to be done to improve the modules, improve scheduling of student time, and controlling the orientation phase for undergraduate students.

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